

Open science and metascience in developmental psychology: Introduction to the special issue

It has been over 10 years since the replicability crisis and open science movement entered the mainstream of psychology (e.g., Simmons et al., 2011). In that time, psychologists have been identifying and describing the nature of the problems with how we do our science (e.g., a lack of transparency, replicability and diversity) and debating proposed solutions for how to right the course. Two main themes emerged in this conversation: open science as a means to increase transparency and accountability and metascience as a way to identify sources of the observed problems by studying science with its own methods.

However, there seems to be an asymmetric focus across subfields within psychological sciences and previously, only a few papers examining developmental psychology existed. At the same time, the specific conditions of developmental research might make the field particularly vulnerable to findings that cannot form a solid basis for theorising, such as difficulty in recruiting populations leading to small samples and indirect tests leading to large amounts of noise (Davis-Kean & Ellis, 2019; Frank et al., 2017). Thus the field might be at risk of falling behind the latest developments in examining the process of generating knowledge with implications for theory, methods and measurement. This risk stands in contrast with existing open science traditions within developmental science, such as a rich history of data sharing (e.g., making language corpus data publicly available since 1984 on CHILDES; MacWhinney, 2000) and the influential big team science collaboration ManyBabies (Frank et al., 2017).

The purpose of this Special Issue was to provide a forum for work on metascience and open science within developmental psychology. We are very pleased to introduce 16 papers – a mix of empirical reports, commentaries, reviews, methodological articles and theoretical articles.

One of the barriers to adopting open science can be not knowing where to start (Kathawalla et al., 2021). Luckily, this special issue includes several helpful ‘how-to’ guides! Kalandadze and Hart (2022) is a great place to start, with an annotated reading list on open developmental science. Turoman et al. (2022) present a workflow for applying open science principles in a developmental psychology lab, using their own lab as an example. Regarding data analysis, Visser et al. (2023) present a tutorial for using Bayesian sequential testing designs and Woods et al. (2023) present best practices for addressing missing data through multiple imputations.

Several articles address best practices when using different methodologies in developmental psychology. Two articles outline guidelines for applying open science practices to descriptive research (Kosie & Lew-Williams, 2022) and longitudinal research (Petersen et al., 2022), respectively. Kucharský et al. (2022) discuss issues with habituation research and recommendations for improving current practices. Qian et al. (2022) document trends in the use of biomarkers in developmental science and provide a tool for examining individual biomarkers in the literature.

One theme that stands out is the importance of generalisability – how applicable a study’s results are to broader groups of people, settings or situations (Kukull & Ganguli, 2012; Parsons et al., 2022). Two papers in this special issue focus on generalisability to broader groups of people. Forbes et al. (2022) highlight the importance of the diversity of participants and researchers, and moving away from the Western ‘norm’. Li et al. (2022) discuss ‘citizen science’ as a tool for increasing the collection of large and diverse samples. Regarding stimuli, Holtz and Papineau (2023) discuss the importance of using varied speakers in stimuli to ensure our results are generalisable.

Another theme that emerges is improving rigour in developmental psychology. Two papers outline how to address issues that apply to much of the published literature in developmental psychology. Shaw and Scheel (2022)

discuss the issue of leading - studies not adequately controlling for researchers and/or caregivers influencing the dependent variable and propose some possible controls. St. Pierre et al. (2022) discuss the issue of experimenter identity not being reported or considered, and suggest how researchers can address this issue. Peetz et al. (2023) discuss the benefits of a multiverse approach to data analysis for transparency, examining robustness and theory building.

Lastly, two papers compare developmental psychology to other disciplines. Rochios and Richmond (2022) compare open science practices across different subfields within psychology and find lower open data and open materials for developmental psychology studies compared to cognitive psychology studies. Dykhuus et al. (2023) compare developmental science and personality science, and they outline what the two fields can gain from adopting advances from each other.

Special issues focused on open science have historically been very important in shaping developmental psychology. In fact, two of the key articles included in the annotated reading list by Kalandadze and Hart (2022) are actually from a previous special issue on 'Replicability, Collaboration, and Best Practices in Infancy Research' at *Infant Behavior and Development* (Davis-Kean & Ellis, 2019; Lundwall, 2019). Similarly, the Registered Reports format (Chambers & Tzavella, 2021) has been introduced to developmental audiences through special issues (Syed et al., 2023; Syed & Donnellan, 2020), including one soon to be published in *Infant and Child Development*. We hope that in the same way, articles from this current special issue will later be considered key articles when thinking and writing about open science and metascience in developmental psychology. From practical 'how-to' guides for embracing open science to discussions on improving rigour and addressing issues of generalisability, the contributions in this issue have been informative and thought-provoking. As we navigate the evolving landscape of developmental psychology, embracing open science practices, enhancing methodological rigour, and fostering inclusivity and diversity will be essential for the continued growth and relevance of the field. We therefore hope that the ideas presented here will inspire researchers to conduct more open, rigorous and inclusive developmental science.

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